

998245

14 Sept 65.

Memo for File - 998245 - DBR -

Telephone call from []

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① Asked him to prepare cost factors on read head for the []

data block - at a meeting held here the previous week. This was for our DBR only - not GIMMARD's.

He felt the cost figures would be excessively high if applied to only one instrument. He is preparing them on the basis of inclusion of the change in both instruments.

② I asked for a detailed write-up on their reason for respooling film prior to putting it on the reader, then having to respool it back on standard reels after reading. Also, from [] we do not get 35mm (Stellar) for use on reader. It will be printed on 70mm film instead.

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③ Cannot read through film base. Need emulsion up in proximity to read head - Why??

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Note: Security breach by [] called on inside line. Told []

[] They will look into.

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DECLASS REVIEW by NIMA/DOD

FCI-812

CLASSIFIED MATERIAL RECEIPT

TO **Technical Representative**

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990245

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DATE

14 Sept 65

BY

any or Individual

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Signature and Title

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TO **Technical Representative**

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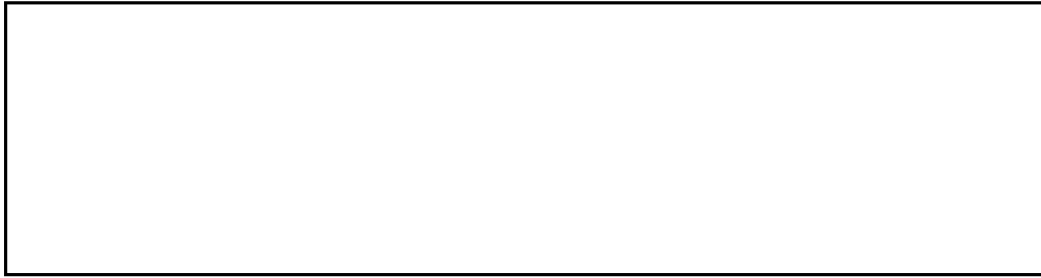
STATINTL

Individual

Signature and Title

998245-

STATINTL



1 September 1965

PROGRESS REPORT NO. 1

7/1/65 - 8/31/65

REPORT NO. SME-BL-1

UNIVERSAL DATA BLOCK READER

This document has been prepared in accordance with the requirements

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Submitted by:



Program Manager

1.0 SUMMARY

The major emphasis during this period of performance has been placed in the following design areas:

- a) Definitization of the General Configuration.
- b) Overall approach to the System Logic.
- c) Analysis of the impact to the System of incorporating the additional formats.
- d) Choice of electronic packaging and assembly techniques.
- e) Film Transport Design.
- f) Selection and evaluation of key components.

Satisfactory progress has been made in each of these areas and is discussed in the appropriate portions of this report. Trips were made to various manufacturers to definitize key subcontracts. The impact of the requested change of scope has been studied and an Engineering Change Proposal will be submitted in the early part of the next report period. Meanwhile work will continue in those areas not affected by the aforementioned change.

2.0 PROGRAM SCHEDULE/MILESTONE STATUS

The major milestones completed during this period were:

- 1) General Configuration Analysis
- 2) Read Head Analysis
- 3) Logic Card Package Design
- 4) Memory Analysis

- 5) Magnetic Tape Recorder Selection
- 6) Core Memory Selection
- 7) Cabinet Selection
- 8) Logic Card Cage Package Design

The major milestones commenced, but not completed during this period were:

- 1) Logic Design
- 2) Film Transport Design
- 3) Head Optics Design
- 4) Read Electronics, Design and Breadboard

Milestones scheduled to be started and/or completed during the next report period are:

- 1) Logic Design
- 2) Transport Design
- 3) Transport Parts Fabrication
- 4) Head Optics Design
- 5) Read Electronics Design and Breadboard
- 6) Read Electronics Package Design
- 7) Logic Cage Wire Lists
- 8) Magnetic Tape Recorder Procurement

- 9) Core Memory Procurement
- 10) Cabinet Procurement
- 11) Read Electronics Parts Procurement
- 12) Data Organization Memory Procurement
- 13) Logic Card Cage Procurement

3.0 GENERAL CONFIGURATION

STATINTL The general configuration of the Universal Data Block Reader is essentially the same as outlined in Proposal SME-PR-09, dated 8 March 1965 with one major exception. As agreed upon between the Customer's representatives and [] at their meeting on 17 August 1965, the use of an incremental tape recorder will be eliminated and replaced by a core buffer store and a standard digital tape drive. This was necessitated by the increased capacity requested.

Cost modification will be reflected in an Engineering Change Proposal which will be submitted during the next period.

4.0 READ HEAD ANALYSIS

STATINTL An analysis was made to determine the type of phototransducer to be employed and the number required for the system. It was decided that the photodiodes specified in the proposal would be best and that one Head Type per system would be required. The decision to employ only one Head type per system necessitates the use of optics in order to accom- STATINTL modate all of the various formats involved. However, this eliminates a number of set-up procedures making the unit more desirable from a [] standpoint. STATINTL

STATINTL A trip was made by [] to our Semiconductor facilities to discuss the implications of the incorporation of the new formats. It was decided that rather than make a new head and rotating it 90°, the same head would be employed and the difference in format dimensions made

up optically with the timing controlled by mounting an incremental encoder directly onto the capstan shaft of the transport. The encoder will, therefore, emit a pulse train which is directly proportional to the film movement. This pulse train will be employed to determine the location of each bit and used to strobe out the data. A more detailed discussion of this approach will be made in the forthcoming Engineering Change Proposal.

5.0 OUTPUT DATA FORMAT

As agreed upon at the meeting held on 17 August 1965, the data format on the magnetic tape will be as follows:

<u>INPUT DATA FORMAT</u> (Film Format)	<u>OUTPUT DATA FORMAT</u> (Magnetic Tape Format)
BCD, Excess three	BCD, Excess three, IBM compatible
BCD	BCD, IBM compatible
Binary	Binary, IBM compatible
Other	Binary, IBM compatible

A record of parity errors detected will be printed out on a re- STATINTL
cording the block number in which the error was detected. No correction will be made of the parity bit so that the computer will also be capable of detecting the error. Cost modification will be reflected in the Engineering Change Proposal which will be submitted during the next period.

6.0 LOGIC CARD PACKAGE DESIGN

During this period the logic card design was completed. As stated in the proposal, all logic elements will be DTuL integrated circuits. To maximize the amount of circuitry per card and yet retain a modular concept, a 40 pin connector was chosen.

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The following standard card types will be employed in the Universal Data Block Reader:

<u>CARD TYPE</u>	<u>DESCRIPTION</u>
FF - 1	4 DTuL 945
NG - 1	3 DTuL 946
NG - 2	3 DTuL 962
NG - 3	3 DTuL 930
NG - 4	2 DTuL 930, 1 DTuL 933
NB - 1	3 DTuL 932
NB - 2	3 DTuL 944

In addition to the above, a blank card has been designed which will allow the building of any special discrete component circuits required while maintaining the same profile as the standard cards.

7.0 MEMORY

An analysis of the memory requirements reveals a need for two types of memories; a fast electronic memory for the data organization and a core memory for buffering the tape recorder. The electronic memory will be made up of MOS Field Effect integrated circuits. The core memory will be word oriented, 8 bits per word and will contain storage for 1,000 words. Therefore, each record on the tape will consist of 1,000 characters or 10 MIL-STD-782A data blocks. The core memory will be a STATINTL
Model MLA-5.

8.0 MAGNETIC TAPE RECORDER

As outlined in paragraph 3.0 the magnetic tape drive will be a standard digital recorder instead of an incremental. The unit selected is the Dotamec Model D-2020 Computer Magnetic Tape Unit. This unit has been in the field for 2 years and has gained an excellent reputation for excellence in design and reliability.

9.0 LOGIC CARD CAGE

During this period the logic card cage package design was completed. Each cage will hold 32 printed circuit boards, and consume 3-1/2 inches of panel space. Each card is supported by nylon guides and to facilitate easy removal a nylon ejector will be mounted on the edge of each card. The guides and ejectors are standard parts manufactured by the []

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10.0 LOGIC DESIGN

In this period the overall machine philosophy was established. A central clocking system will be employed similar to that used in a general purpose computer. Detailed logic designs for the data intake and reorganization sections were completed. In addition, the interface between the DTuL input register and the MOS memory has been breadboarded and tested.

11.0 FILM TRANSPORT

The Film Transport design started during this period and is near completion. Detailing of some of the parts has commenced and releases to the shop for breadboard parts will be made during the early part of the next period. To avoid duplication, work in the area of the Head mount and Head optics has been rescheduled pending approval of the forthcoming Engineering Change Proposal.

As specified in the proposal, the film transport will be capable of handling 35 mm, 70 mm, 5 inch, 6.6 inch, 8 inch and 9-1/2 inch films. Due to the fact that each of these films is a different size and has a completely different reel structure, it will be necessary to rewind the film onto special reels designed for the Universal Data Block Reader. To facilitate this operation, [] will design and supply with the equipment a motorized reel winder. This winder will be separate from the Reader in order that reading and re-winding of different films can occur simultaneously. As agreed, the reel capacities will be 1,000 feet for film sizes 35 mm and 70 mm, and 500 feet for all of the others.

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The transport is basically a bi-directional film transport, capstan driven with motorized take up and supply spools. No attempt has been made to maintain constant film velocities since an index or strobing pulse is always

available to indicate when reading is to be performed. Guiding of the film will be controlled by accurately machined reels supplied with the system. The transport will mount horizontally due to the weight of the large reels of film involved. The transport will be mounted at counter top height to facilitate ease of operation.

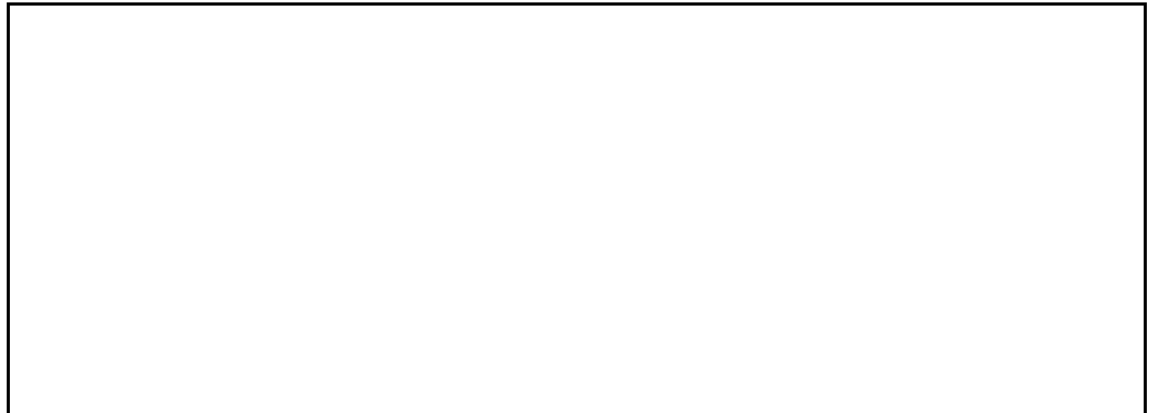
12.0 READ ELECTRONICS

In this period the overall approach to the read electronics was established. Initial designs have been generated and a breadboard is in the process of being constructed. After completion of the breadboard and test phase, package design considerations will be looked into and the design will be finalized. While it would be feasible to employ microcircuit techniques in building the read amplifiers, due to time considerations, these circuits will be made out of discrete semiconductor devices.

13.0 SUBCONTRACT STATUS

This section represents a tentative list of major subcontractors of the Universal Data Block Reader. It is not to be construed that this list denotes placing of orders, but rather a reflection of project planning at this time.

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